**Unit 1: Linear Systems**

**Example 1: Solve a Linear System Using the Method of Elimination**

Solve the system of linear equations

3x + y = 19  
4x – y = 2

**Solution**

**3x + y = 19  
4x – y = 2**

**7x = 21**

**X = 3**

**Substitute x = 3 into equation 1 to find y**

**3x + y = 19**

**3 (3) + y = 19**

**9 + y = 19**

**Y = 19 – 9**

**Y = 10**

**Check Answers by substituting x = 3 and y = 10 into both equations**

**In 3x + y = 19 In 4x – y = 2  
LS = 3x + y RS = 19 LS = 4x – y RS = 2  
= 3 (3) + 10 = 4 (3) - 10**

**= 19 = 2**

**LS = RS THEREFORE SOLUTIONS ARE CORRECT**

Example 2: Solve Using Elimination

Solve the Linear System

10x + 4y = -1  
8x – 2y = 7

**Solution**

**If we multiply equation #2 by 2, then add to eliminate terms.**

**10x + 4y = -1  
8x – 2y = 7  
Multiply Each Equation 2 by 2**

**10x + 4y = -1  
16x – 4y = 14  
26 x = 13**

**X = ½**

**Substitute x = ½ into equation 2 to find the y value**

**8 – 2y = 7**

**8 (1/2) – 2y = 7**

**4 – 2y = 7**

**-2y = 7 – 4**

**-2y = 3**

**Y = - 3/2**